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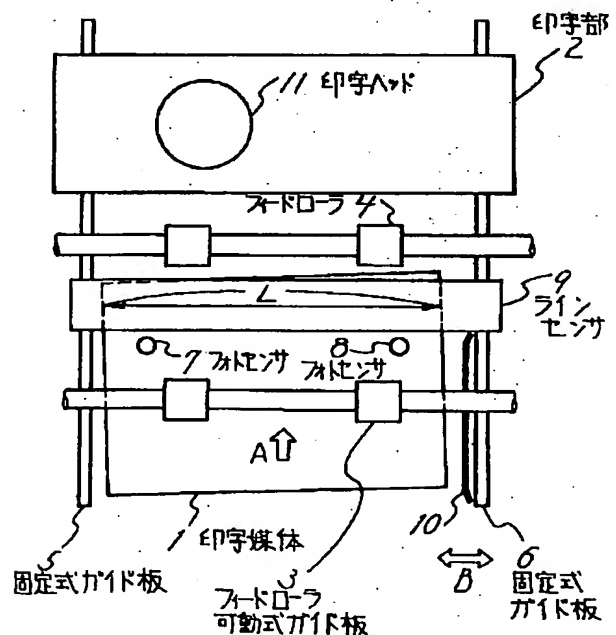
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(54)【発明の名称】 プリンタ装置のフロントインサータ

(57)【要約】

【目的】 プリンタ装置のフロントインサータにおいて、印字媒体の斜行修正をする場合、薄くて腰の弱い印字媒体にも適用可能にする。

【構成】 挿入された印字媒体を印字部まで搬送するフィードローラ3、4と、印字媒体1の搬送をガイドするガイド板5、6と、印字媒体1の横幅を検出する手段と、印字媒体の横幅に合わせてフロントインサータの幅を変換するガイド板10と構成し、印字媒体1の端面をガイド板5、10で挟むことにより、印字媒体1の斜行を修正する。さらに、印字媒体の横幅を検出する手段を印字媒体の吸入方向と直角をなす方向の長さLを検出するラインセンサ9と、印字媒体1の斜行量 $\delta$ を検出するフォトセンサ7、8と、この長さLと斜行量 $\delta$ とから印字媒体1の横幅を算出する制御部とで構成する。



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## 【特許請求の範囲】

【請求項1】 挿入された印字媒体を印字部まで搬送する印字媒体搬送手段と、前記印字媒体の搬送を案内するガイド板とを備えるプリンタ装置のフロントインサータにおいて、前記印字媒体の横幅寸法を検出する横幅検出手段を有し、かつ前記ガイド板が検出された前記印字媒体の前記横幅寸法に応じてフロントインサータの幅を可変するようにしたことを特徴とするプリンタ装置のフロントインサータ。

【請求項2】 前記横幅検出手段は、前記印字媒体が吸入方向と直角をなす方向の長さ $L$ を計測するラインセンサと、前記印字媒体の斜行量 $\delta$ を計測する2つのフォトセンサと、前記ラインセンサおよび前記2つのフォトセンサがそれぞれ計測する前記長さ $L$ と前記斜行量 $\delta$ とから前記印字媒体の横幅寸法を算出する制御部とからなることを特徴とする請求項1記載のプリンタ装置のフロントインサータ。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】本発明は、プリンタ装置のフロントインサータに関し、特に印字媒体を印字部まで搬送するフロントインサータに関する。

## 【0002】

【従来の技術】従来のプリンタ装置のフロントインサータは、印字媒体をガイド板やストッパに強制的に押し付けることにより印字媒体の斜行を修正している。例えば、図5(a)、(b)に示すように、斜めにセットされた印字媒体(破線で示す)12を斜行修正ローラ15、16で挟持し、固定ガイド板17とストッパ19、20の押し付けることにより、印字媒体12の斜行を実線30で示すように修正する。この後、ストッパ19、20を退避し、フィードローラ13、14により印字媒体12を印字部21まで搬送する方式を採っている。

## 【0003】

【発明が解決しようとする課題】この従来のプリント装置のフロントインサータは、印字媒体をガイド板やストッパに強制的に押し付けているため、厚さが薄く腰の弱い印字媒体を用いる場合には、折れ曲ってしまうため斜行修正ができないという欠点があった。

## 【0004】

【課題を解決するための手段】本発明は、挿入された印字媒体を印字部まで搬送する印字媒体搬送手段と、前記印字媒体の搬送を案内するガイド板とを備えるプリンタ装置のフロントインサータにおいて、前記印字媒体の横幅寸法を検出する横幅検出手段を有し、かつ前記ガイド板が検出された前記印字媒体の前記横幅寸法に応じてフロントインサータの幅を可変するようにしたことを特徴とする。

【0005】また、前記横幅検出手段は、前記印字媒体が吸入方向と直角をなす方向の長さ $L$ を計測するライン

センサと、前記印字媒体の斜行量 $\delta$ を計測する2つのフォトセンサと、前記ラインセンサおよび前記2つのフォトセンサがそれぞれ計測する前記長さ $L$ と前記斜行量 $\delta$ とから前記印字媒体の横幅寸法を算出する制御部とからなってもよい。

## 【0006】

【実施例】次に、本発明について図面を参照して説明する。

【0007】図1は本発明の一実施例を構成を示す正面図である。図1において、本実施例は印字媒体1をクランプして印字部2まで搬送し、印字終了後は吸排口へ搬出するフィードローラ3、4と、印字媒体の挿入を案内する固定式ガイド板5、6と、吸入された印字媒体1の斜行量 $\delta$ (図2参照)を検出するためのフォトセンサ7、8と、挿入された印字媒体1の印字媒体吸入方向と直角をなす方向の長さ $L$ (図2参照)を検出するラインセンサ9と、矢印B方向に可動する可動ガイド10とから構成される。

【0008】図2はフォトセンサ7、8を用いて印字媒体1の傾き角 $\theta$ を検出する方法を説明する図である。図2において、矢印で示す印字媒体1の搬送速度 $v$ より斜行量 $\delta$ が求められ、斜行量 $\delta$ と2つのフォトセンサ7、8との距離 $a$ より印字媒体の傾き $\theta$ が求められる。

【0009】図3は印字媒体1の吸入方向と直角をなす方向の印字媒体の長さ $L$ と、印字媒体1の傾き角 $\theta$ と、印字媒体1の横幅寸法 $D$ との関係を説明する図である。また、図4は本実施例における各処理の流れを示す流れ図である。

【0010】次に、本実施例の動作について図面を参照して説明する。図1において、印字媒体1を矢印A方向に挿入すると、フィードローラ3は印字媒体1を挟持してラインセンサ9の位置まで一定速度 $v$ で搬送する。このとき、印字媒体1の先端がフォトセンサ7、8を通過するが、フォトセンサ7とフォトセンサ8との位置は印字媒体吸入方向、すなわち、矢印A方向と角をなす線上に設けられているため、各センサが作動するタイミングのずれ $\Delta t$ を計測すれば、斜行量 $\delta$ (図2参照)は、 $\delta = v \times \Delta t$ により求められる。したがって、図2より印字媒体の傾き $\theta$ は、 $\theta = \tan^{-1}(\delta/a)$ となる。また、印字媒体吸入方向と直角をなす方向の長さ $L$ は、ラインセンサ9の出力より決まるため、実際の印字媒体1の横幅寸法 $D$ は、図3より $D = L \cos \theta$ として求められる。

【0011】次に、フィードローラ3のクランプを解除し、図1の矢印B方向に可動ガイド板10を固定ガイド板5との距離が、印字媒体1の横幅寸法 $D$ と等しくなるまで動かして停める。そうすると、印字媒体1は固定ガイド板5と可動ガイド板10に挟まれ、斜行が修正され正しい位置にセットされる。そして、フィードローラ3で再び挟持した後、フィードローラ3、4により印字媒

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体1を印字部2まで搬送する。

【0012】

【発明の効果】以上説明したように本発明は、印字媒体の横幅寸法をセンサで検出しフロントインサータの幅を印字媒体の横幅寸法に合わせて調整することにより、印字媒体をガイド板やストッパに強制的に押し付けることなく、薄く腰の弱い印字媒体の斜行修正も可能になるという結果を有する。

【図面の簡単な説明】

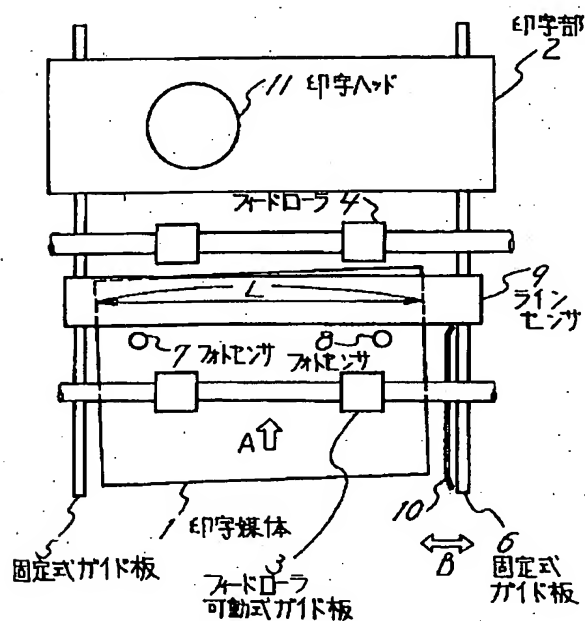
【図1】本発明の一実施例の構成を示す正面図である。

【図2】図1の印字媒体1の斜行量を検出する方法を説明する図である。

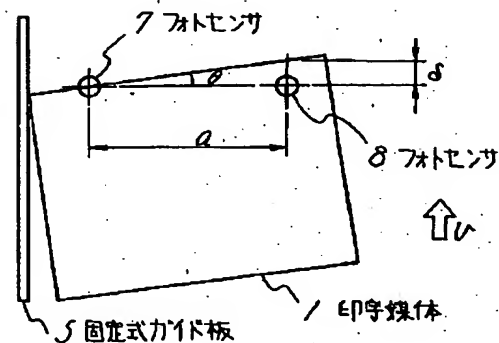
【図3】図1の印字媒体1の横幅を検出する方法を説明する図である。

【図4】本実施例における各処理の流れを示す流れ図で

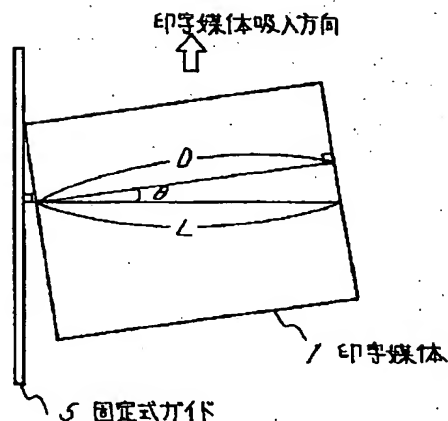
【図1】



【図2】



【図3】



ある。

【図5】分図(a)は従来の構成を示す正面図であり、分図(b)は同図(a)の側面図である。

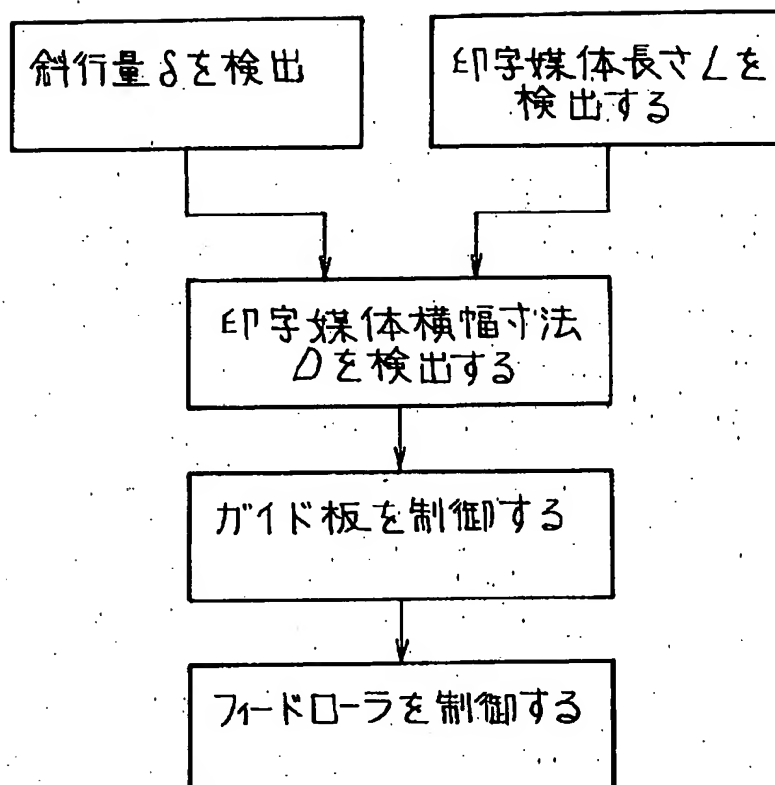
【符号の説明】

- 1, 12 印字媒体
- 2, 21 印字部
- 3, 4, 13, 14 フィードローラ
- 5, 6, 17, 18 固定式ガイド板
- 7, 8 フォトセンサ
- 9 ラインセンサ
- 10 可動式ガイド板
- 11, 22 印字ヘッド
- 15, 16 斜行修正ローラ
- 19, 20 ストップ

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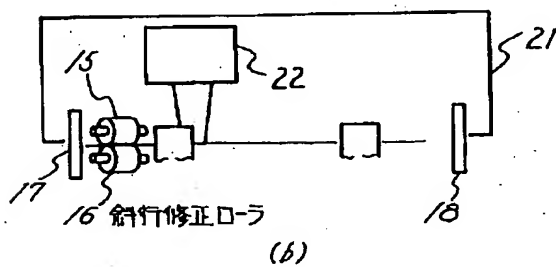
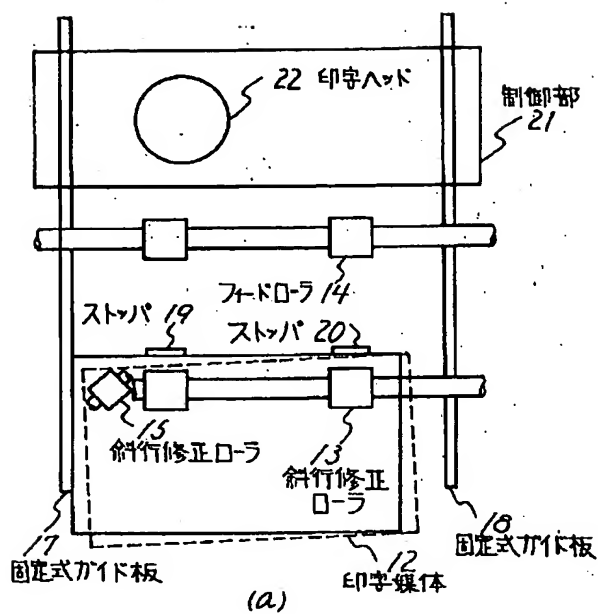
【図 4】



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【図 5】



**FRONT INSERTER FOR PRINTING DEVICE**

Patent Number: JP5294517  
Publication date: 1993-11-09  
Inventor(s): KAJITANI HIROSHI  
Applicant(s): NEC CORP  
Requested Patent: ☐ JP5294517  
Application Number: JP19920084321 19920407  
Priority Number(s):  
IPC Classification: B65H9/04; B41J13/00  
E.C. Classification:  
Equivalents:

**Abstract**

**PURPOSE:** To enable application of printing medium which is thin and weak in stiffness when the movement of the printing medium in slant direction is corrected, in a front inserter for a printing device.  
**CONSTITUTION:** A front inserter comprises feed rollers 3 and 4 for transferring an inserted printing medium to a printing section, guide plates 5 and 6 for guiding the transfer of the printing medium 1, a means for detecting the lateral width of the printing medium 1, and a guide plate 10 for varying the width of the front inserter according to the lateral width of the printing medium, and the ends of the printing medium 1 are held by the guide plates 5 and 10, respectively, to correct movement of the printing medium in slant direction. Also a means for detecting the lateral width of the printing medium comprises a line sensor 9 for detecting a length L of the printing medium in a direction at right angle to a suction direction, photo sensors 7 and 8 for detecting the amount of movement in slant direction 6 of the printing medium 1, and a control section for calculating the lateral width of the printing medium 1 from the length L and the amount of movement in slant direction delta.

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# PATENT ABSTRACTS OF JAPAN

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B41J 13/00

(21)Application number : 04-084321 (71)Applicant : NEC CORP

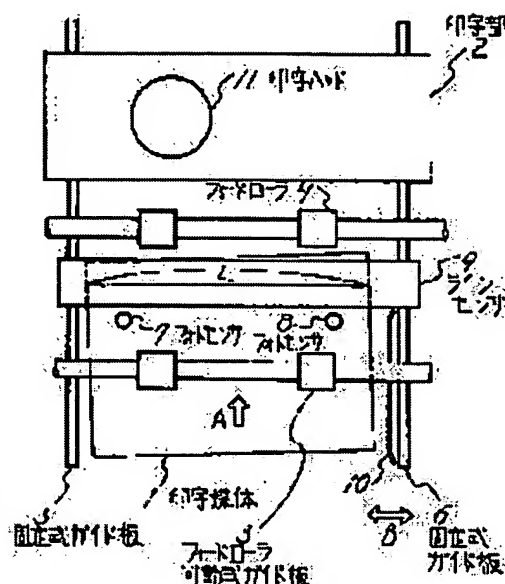
(22)Date of filing : 07.04.1992 (72)Inventor : KAJITANI HIROSHI

## (54) FRONT INSERTER FOR PRINTING DEVICE

### (57)Abstract:

**PURPOSE:** To enable application of printing medium which is thin and weak in stiffness when the movement of the printing medium in slant direction is corrected, in a front inserter for a printing device.

**CONSTITUTION:** A front inserter comprises feed rollers 3 and 4 for transferring an inserted printing medium to a printing section, guide plates 5 and 6 for guiding the transfer of the printing medium 1, a means for detecting the lateral width of the printing medium 1, and a guide plate 10 for varying the width of the front inserter according to the lateral width of the printing medium, and the ends of the printing medium 1 are held by the guide plates 5 and 10, respectively, to correct movement of the printing medium in slant direction. Also a means for detecting the lateral width of the printing medium comprises a line sensor 9 for detecting a length L of the printing medium in a direction at right angle to a suction direction, photo sensors 7 and 8 for detecting the amount of movement in slant direction  $\delta$  of the printing medium 1, and a control section for calculating the lateral width of the printing medium 1 from the length L and the amount of movement in slant direction  $\delta$ .



## LEGAL STATUS

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[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

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CLAIMS

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[Claim(s)]

[Claim 1] The front inserter of the printer equipment characterized by to carry out adjustable [ of the width of face of a front inserter ] according to said breadth size of said printing data medium by which it has a breadth detection means detect a breadth size of said printing data medium, in the front inserter of printer equipment equipped with a printing data-medium conveyance means convey inserted printing data medium to the printing section, and a guide plate to which it shows conveyance of said printing data medium, and said guide plate was detected.

[Claim 2] Said breadth detection means is the front inserter of printer equipment according to claim 1 characterized by for said printing data medium to consist of said length L which the inhalation direction, a line sensor which measures lay length L which makes a right angle, two photosensors which measure the amount delta of skews of said printing data medium, and said line sensor and said two photosensors measure, respectively, and a control section which computes a breadth size of said printing data medium from said amount delta of skews.

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] Especially this invention relates to the front inserter which conveys printing data medium to the printing section about the front inserter of printer equipment.

[0002]

[Description of the Prior Art] The front inserter of conventional printer equipment is correcting the skew of printing data medium by pushing printing data medium against a guide plate or a stopper compulsorily. For example, as shown in drawing 5 (a) and (b), when printing data medium (a dashed line shows) 12 set aslant is pinched with the skew correction rollers 15 and 16 and the fixed guide plate 17 and stoppers 19 and 20 push, as a continuous line shows by carrying out the skew of printing data medium 12, it corrects. Then, stoppers 19 and 20 were evacuated and the method which conveys printing data medium 12 to the printing section 21 by feed rollers 13 and 14 is taken.

[0003]

[Problem(s) to be Solved by the Invention] Since printing data medium was compulsorily pushed against the guide plate or the stopper, when thickness used thin weak printing data medium of the waist, in order that crease music might keep the front inserter of this conventional printing equipment, it had the defect that skew correction could not be performed.

[0004]

[Means for Solving the Problem] This invention is characterized by to carry out adjustable [ of the width of face of a front inserter ] according to said breadth size of said printing data medium by which it has a breadth detection means detect a breadth size of said printing data medium, and said guide plate was detected in the front inserter of printer equipment equipped with a printing data-medium conveyance means convey inserted printing data medium to the printing section, and a guide plate to which it shows conveyance of said printing data medium.

[0005] Moreover, said breadth detection means may consist of a control section to which said printing data medium computes a breadth size of said printing data medium from said length L which the inhalation direction, a line sensor which measures lay length L to which a right angle is made, two photosensors which measure the amount delta of skews of said printing data medium, and said line sensor and said two photosensors measure, respectively, and said amount delta of skews.

[0006]

[Example] Next, this invention is explained with reference to a drawing.

[0007] Drawing 1 is the front view showing a configuration for one example of this invention. The feed rollers 3 and 4 which this example clamps printing data medium 1, convey it to the printing section 2 in drawing 1, and take out after printing termination to pumping opening, The stationary type guide plates 5 and 6 to which it shows insertion of printing data medium, and the photosensors 7 and 8 for detecting the amount delta of skews of inhaled printing data medium 1 (referring to drawing 2), It consists of a printing data-medium inhalation direction of inserted printing data medium 1, a line sensor 9 which detects lay length L (refer to drawing 2) which makes a right angle, and a movable guide 10 which

carries out movable in the direction of arrow head B.

[0008] Drawing 2 is drawing explaining how to detect angle-of-inclination theta of printing data medium 1 using photosensors 7 and 8. In drawing 2, the amount delta of skews is calculated from the bearer rate  $v$  of printing data medium 1 shown by the arrow head, and inclination theta of printing data medium is called for from the distance  $a$  of the amount delta of skews, and two photosensors 7 and 8.

[0009] Drawing 3 is drawing which explains relation with the breadth size  $D$  of printing data medium 1 to be length  $L$  of printing data medium of the inhalation direction of printing data medium 1, and the direction which makes a right angle, and angle-of-inclination theta of printing data medium 1.

Moreover, drawing 4 is the flow chart showing the flow of each processing in this example.

[0010] Next, actuation of this example is explained with reference to a drawing. In drawing 1, if printing data medium 1 is inserted in the direction of arrow head A, a feed roller 3 will pinch printing data medium 1, and will convey it with constant speed  $v$  to the location of a line sensor 9. Although the tip of printing data medium 1 passes photosensors 7 and 8 at this time, since the location of photosensor 7 and photosensor 8 is prepared on the line which makes the printing data-medium inhalation direction of arrow head A, i.e., the direction, and an angle, if gap  $\Delta t$  of the timing to which each sensor operates is measured, the amount delta of skews (refer to drawing 2) will be calculated by  $\Delta = v \Delta t$ . Therefore, inclination theta of printing data medium becomes  $\theta = \tan^{-1}(\Delta/a)$  from drawing 2. Moreover, since lay length  $L$  which makes the printing data-medium inhalation direction and a right angle is decided from the output of a line sensor 9, the breadth size  $D$  of actual printing data medium 1 called for as  $D = L \cos \theta$  from drawing 3.

[0011] Next, the clamp of a feed roller 3 is canceled, in the direction of arrow head B of drawing 1, it moves and the movable guide plate 10 is stopped until distance with the fixed guide plate 5 becomes equal to the breadth size  $D$  of printing data medium 1. If it does so, it will be inserted into the fixed guide plate 5 and the movable guide plate 10, a skew will be corrected, and printing data medium 1 will be set to a right location. And after pinching again by the feed roller 3, printing data medium 1 is conveyed to the printing section 2 by feed rollers 3 and 4.

[0012]

[Effect of the Invention] As explained above, skew correction of thin weak printing data medium of the waist also has the result of becoming possible, without pushing printing data medium against a guide plate or a stopper compulsorily by this invention's detecting the breadth size of printing data medium by the sensor, and adjusting the width of face of a front inserter according to the breadth size of printing data medium.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the front view showing the configuration of one example of this invention.

[Drawing 2] It is drawing explaining how to detect the amount of skews of printing data medium 1 of drawing 1 .

[Drawing 3] It is drawing explaining how to detect the breadth of printing data medium 1 of drawing 1 .

[Drawing 4] It is the flow chart showing the flow of each processing in this example.

[Drawing 5] A part Fig. (a) is the front view showing the conventional configuration, and a part Fig. (b) is a side elevation of this drawing (a).

[Description of Notations]

1 12 Printing data medium

2 21 Printing section

3, 4, 13, 14 Feed roller

5, 6, 17, 18 Stationary type guide plate

7 Eight Photosensor

9 Line Sensor

10 Working Guide Plate

11 22 Print head

15 16 Skew correction roller

19 20 Stopper

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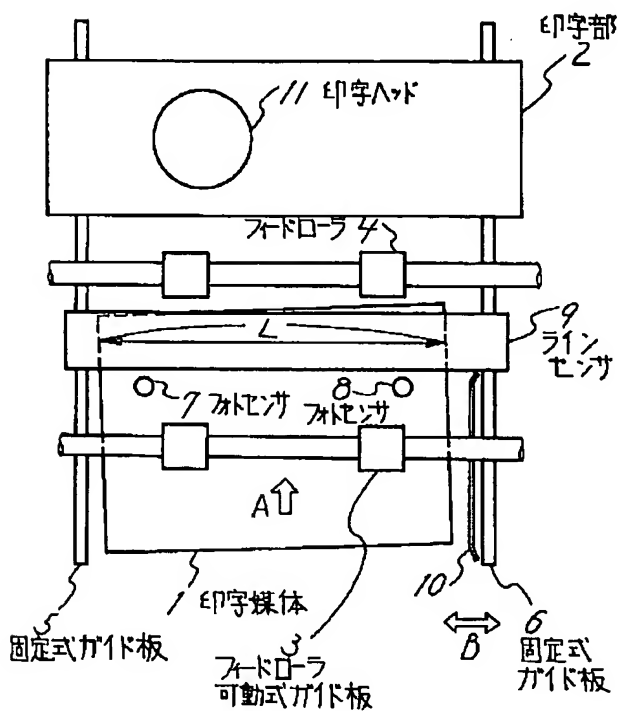
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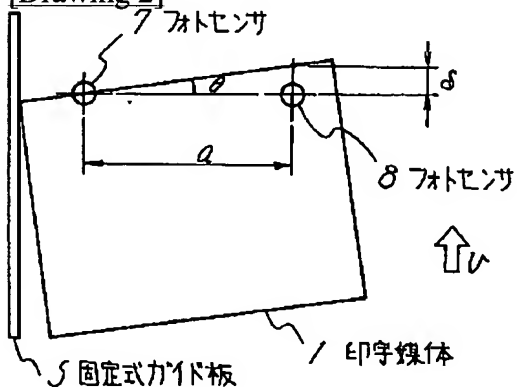
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## DRAWINGS

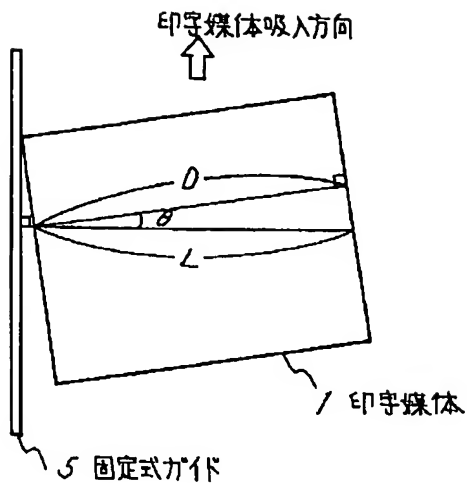
[Drawing 1]



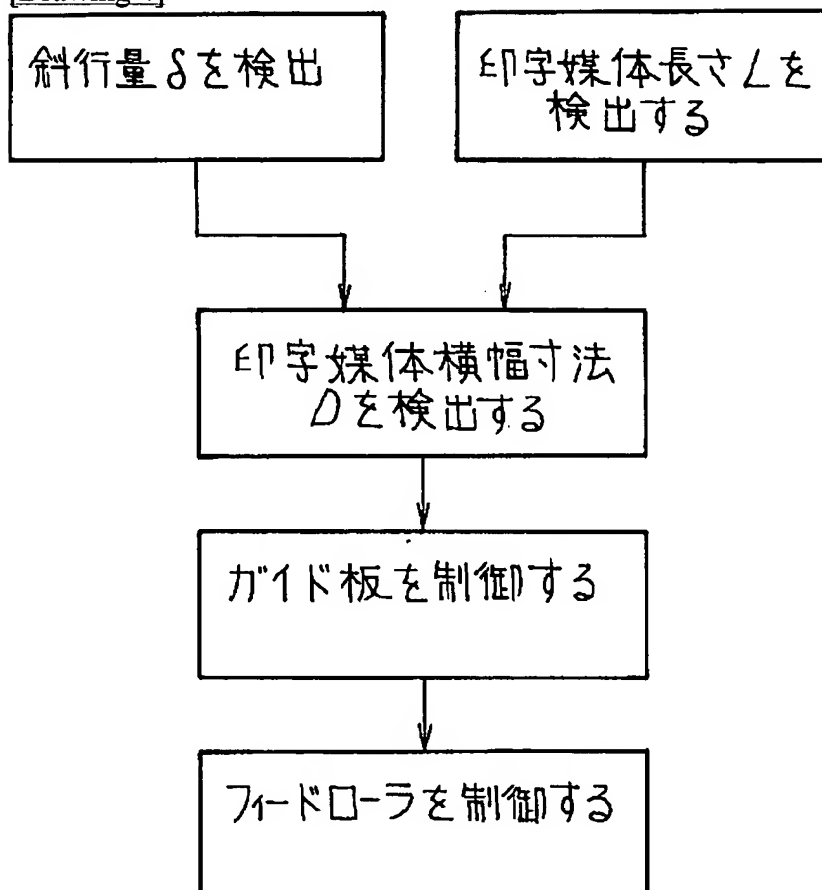
[Drawing 2]



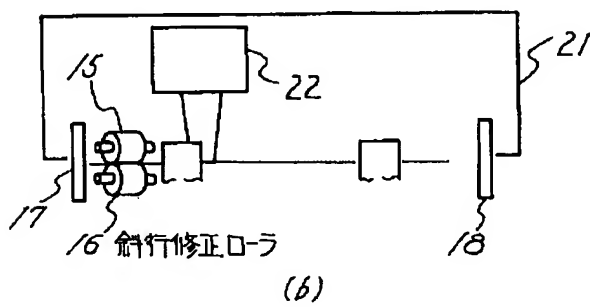
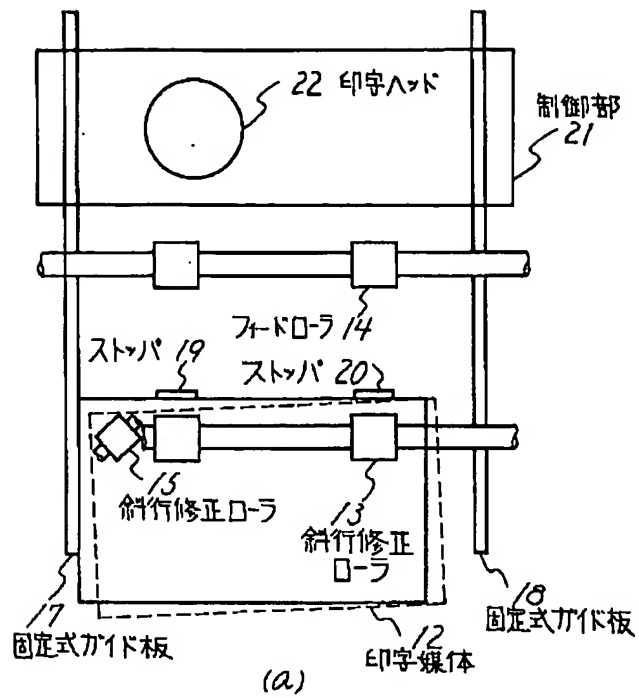
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Translation done.]